Controls Operation, and Troubleshooting

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SAFETY CONSIDERATIONS

Installing, starting up, and servicing this equipment can be hazardous due to system pressures, electrical components; and equipment location (roof, elevated structures, etc.). Only trained, qualified installers and service mechanics should install, start up, and service this equipment.

When working on this equipment, observe precautions in the literature; on tags, stickers, and labels attached to the equipment, and any other safety precautions that apply. Follow all safety codes. Wear safety glasses and work gloves. Use care in handling, rigging, and setting this equipment, and in handling all electrical components.

⚠ WARNING

Electrical shock can cause personal injury and death. Shut off all power to this equipment during installation and service. There may be more than one disconnect switch. Tag all disconnect locations to alert others not to restore power until work is completed.

⚠ WARNING

This unit uses a microprocessor-based electronic control system. *Do not* use jumpers or other tools to short out components, or to bypass or otherwise depart from recommended procedures. Any short-to-ground of the control board or accompanying wiring may destroy the electronic modules or electrical components.

GENERAL

IMPORTANT: This literature contains controls, operation, and troubleshooting data for 48FK,JK and 50FK,FY,JK,JY variable air volume rooftop units. Use this guide in conjunction with the separate Installation Instructions literature packaged with the unit.

Carrier 48FK,JK and 50FK,FY,JK,JY units provide ventilation, cooling, and heating (when equipped) in Variable Air Volume (VAV) applications. These units contain factory-installed controls which provide full system management. The unit controls also perform self diagnostic tests at unit start-up, monitor operation of the unit, and provide alarms. Information on system operation and status are sent to the central processors by various sensors that are located at the unit and in the conditioned space. Each unit is equipped with a display board.

Rooftop Information — The rooftop controls cycle supply-fan motor, compressors, and unloaders to maintain the proper temperature conditions. The controls also cycle condenser fans to maintain suitable head pressure. Safeties are continuously monitored to prevent the unit from operating under abnormal conditions. The controls provide control of economizer and cycle or control heating as required.

The controls also allow the service person to operate a 'quick test' so that all the controlled components can be checked for proper operation.

IMPORTANT: The field-supplied and installed switch (or timeclock) MUST BE CLOSED to put unit into the Occupied mode. Unit WILL NOT START until this is accomplished. See base unit installation instructions literature for details.

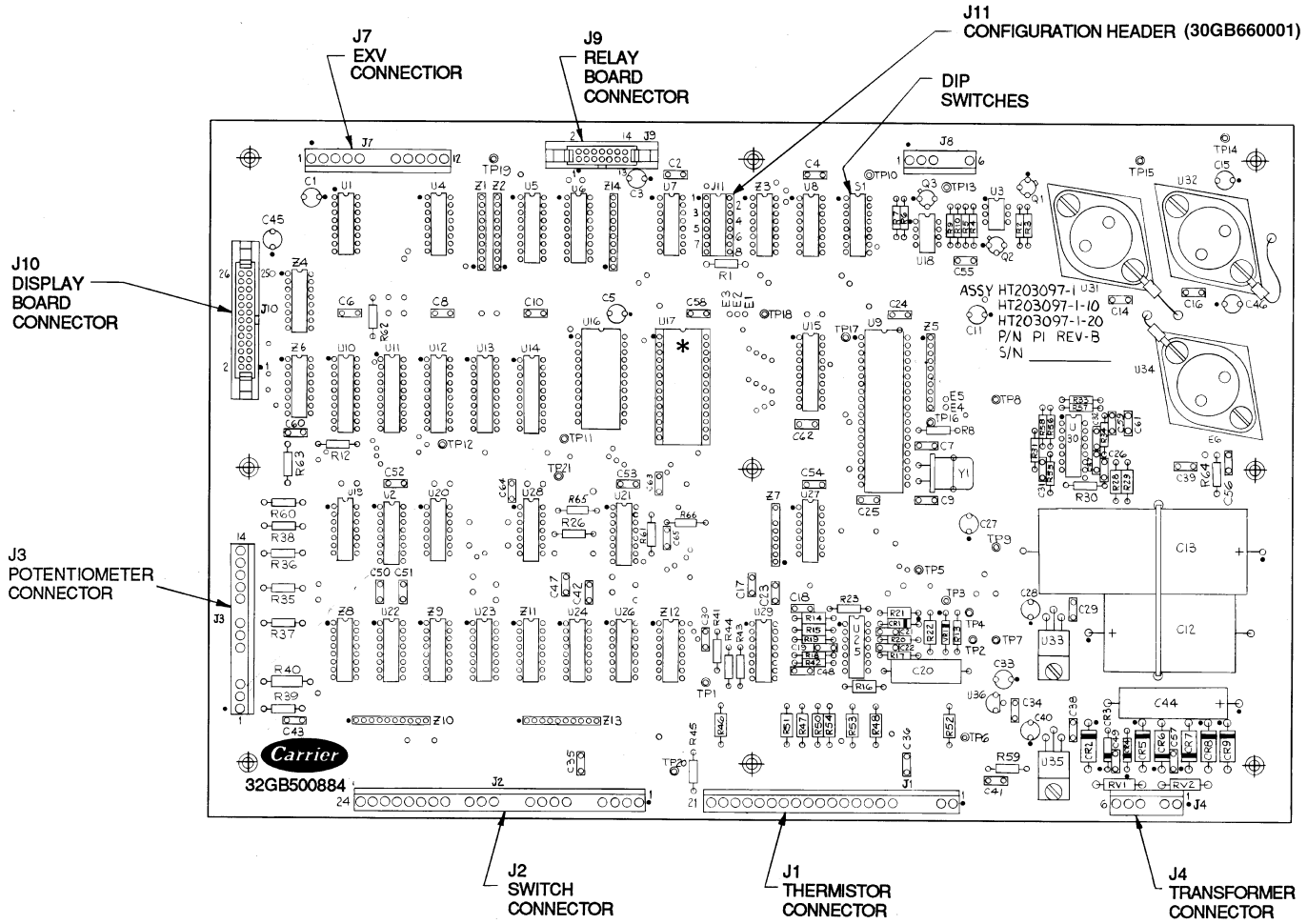
VAV Control System — The 30 to 100-ton VAV rooftop units contain a microprocessor-based electronic control system that controls and monitors the rooftop unit functions.

The VAV control system is composed of several components:
- processor board
- relay board
- display board
- thermistors
- compressor operation feedback (control relay)
- accessory board
- temperature reset package*
- single-step demand limit*
- two-step demand limit control module*

*Field-installed accessories.

The VAV control system monitors and controls the following functions of the rooftop unit:
- supply-air temperature (unit capacity)
- morning warm-up or electric heat (if equipped)
- head pressure control, fan cycling
- economizer position
- diagnostic display
- unit check-out (quick test)
- supply air temperature reset (if equipped)
- demand limiting (if equipped)

Processor Board — The processor board, shown in Fig. 1, contains the logic and the necessary hardware to drive the outputs and the display board. The processor board is enclosed by a sheet metal cover and a heater. The heater is controlled by a thermostat to keep the processor temperature above 32 F (0° C). All electrical connections are made to the processor board through wire and ribbon cables.



LEGEND

DIP — Dual In-Line Package
EPROM — Erasable, Programmable Read-Only Memory
EXV — Electronic Expansion Valve

⚠ WARNING

Do not remove label covering EPROM. Removal causes program to be erased.

*EPROM HT204485-1-XX where "XX" is the current revision number.

NOTE: Processor Board is positioned in unit with J3 and J10 connections at the bottom.

Fig. 1 — Processor Board

Several temperature inputs are connected to the processor. There are either 4 or 5 thermistors (depending on the field-installed accessories) which input temperature data into the processor through pin terminal connector J1. See Table 1 and Fig. 2.

Several status switches are also monitored. These switches are connected to the processor at pin terminal connector J2. See Fig. 3 and Table 2.

Table 1 — Pin Terminal Connector J1 Thermistor Inputs

CONNECTOR J1 TERMINAL NO.	TEMPERATURE INPUT	UNIT SIZE 034-104
1,2	Reset Temperature*	T10
14,15	Saturated Condensing Temp., Circuit 2	T4
16,17	Saturated Condensing Temp., Circuit 1	T3
18,19	Return-Air Temperature	T2
20,21	Supply-Air Temperature	T1

LEGEND

T — Thermistor

*If equipped with accessory temperature reset package.

NOTE: Terminal numbers 3-13 are not used on these units.

In addition to the unit status switch inputs, the processor board also accepts inputs from several potentiometers. These potentiometers control various operational characteristics of the system. Inputs are received by the processor through pin terminal connector J3. See Fig. 4.

All of the potentiometers must be set before the unit is started in order for the unit to function properly. See Start-Up, Potentiometers section on page 28 for information on establishing set points. Each of the potentiometers has a valid range that is used by the control. The valid range is defined as the potentiometer's resistance value that the control will not consider to be in error. This is usually between 10% and 90% of the potentiometer's total resistance. The control has been programmed to accept an operational range for the potentiometer, which may not be the same as the valid range.

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